



Alloy

ALLOYS
AND
ITS USES

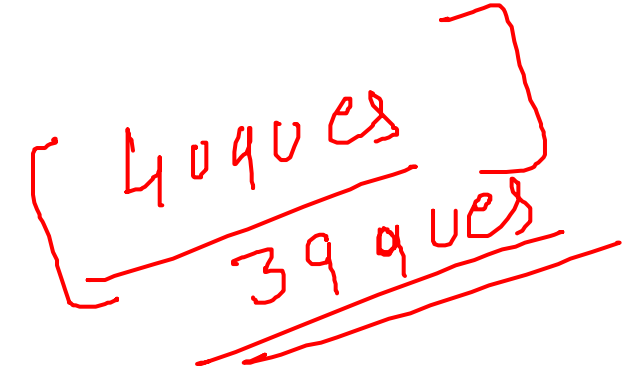
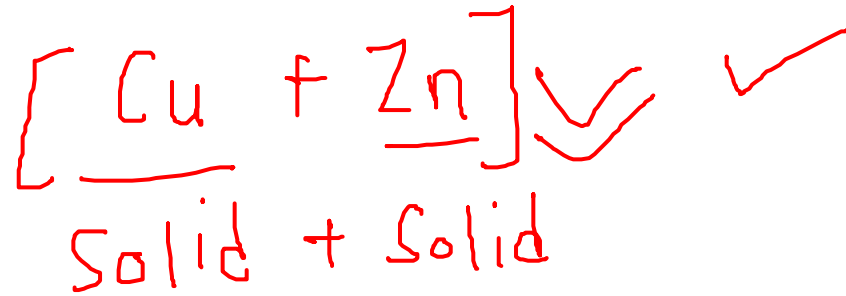
ALLOYS (मिश्रित धातु) ✓

- Alloys are a mixture of two or more metals or a metal and a non metal and can not be separated into their components by any physical method.
- मिश्र धातु दो या दो से अधिक धातुओं या एक धातु और एक अधातु का मिश्रण है और इन्हें किसी भी भौतिक विधि द्वारा अपने घटकों में अलग नहीं किया जा सकता है।

Alloye → metal + metal

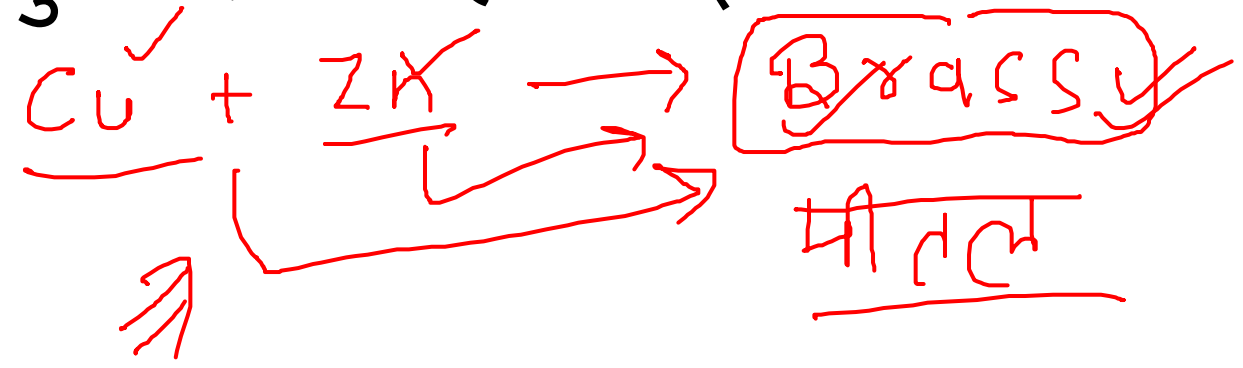
metal + non metal + _____

- Alloy is a homogeneous mixture that is solid to solid solution.
- मिश्र धातु एक सजातीय मिश्रण हैं।



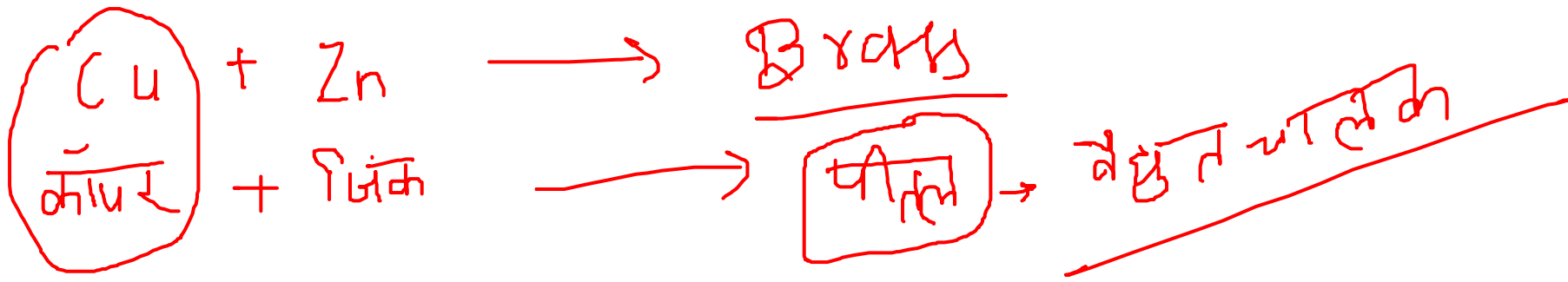
- It shows the property of its constituents and can have variable composition.

- यह अपने घटकों की गुण दिखाता है और इसमें परिवर्तनशील संरचना हो सकती है।



④ Electrical Conductivity of Alloys are less compared to pure metals. ✓

e.g.:



⑤ Alloys \rightarrow Melting Point (गलनांक) \uparrow बढ़ता है

Pure metal \rightarrow " " " \downarrow

*

Brass

100%

→

Zinc

↓

30%

+ Cu

↓

70%

→

⇒ Mercury + Silver, Zinc, Tin
↳ Tooth filling by dentist.

(cavity) उत्पत्ति

Mercury + Silver] → Amalgam

⇒

* Alloy of Gold (सोने की मिश्रधातु)

Pure Gold \Rightarrow 24 carat \rightarrow Gold की Purity unit.

very soft \Rightarrow Not suitable for making Jewellery.

\Rightarrow 22 carat + 2 carat $\left[\begin{array}{c} \text{Ag} \\ \text{Cu} \end{array} \right]$

Important Alloys

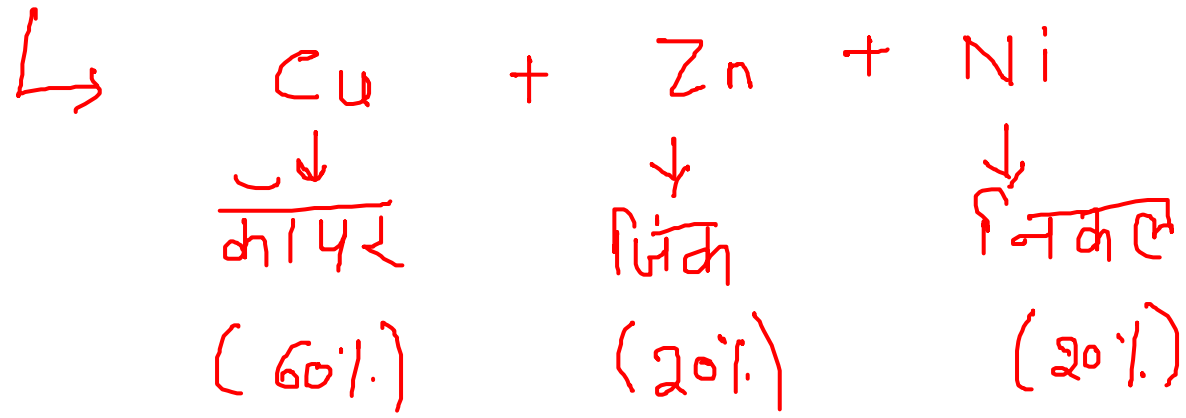
① Brass \Rightarrow Cu + Zn
70% + 30%

uses:- Bell, utensils.

② Bronze:- Cu + Sn
90% + 10%

uses:- coins, Bell, utensils, medals

③ German Silver:- [Silver → 0%.]



uses:-

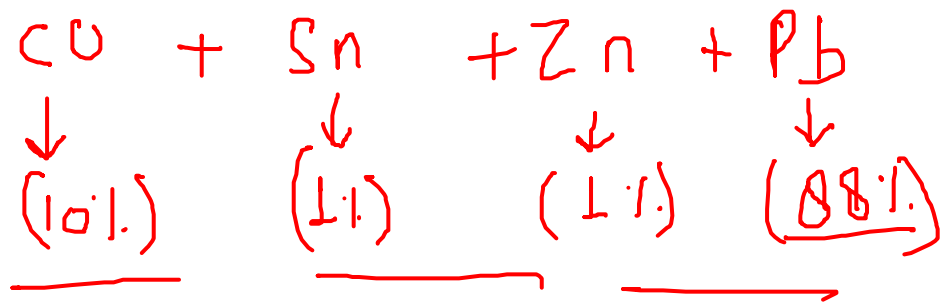
utensils, Jewellery, handle.

④ Rolled Gold (Artificial Jewellery):-
Gold

⇒ Cu + Al
(कापर) + (एल्युमिनियम)
(१०%) + (१०%)

⇒ Uses: cheap ornaments (अभूषण)

⑤ Gun Metal:-



Uses:- Guns, Barrels, Gears, Bearings.

⑥ Dutch Metal:-



⑦ Monel Metal:- $\frac{\text{Cu}}{70\%}$ + $\frac{\text{Ni}}{30\%}$

Uses:- Resist \rightarrow Rusting & Corrosion.

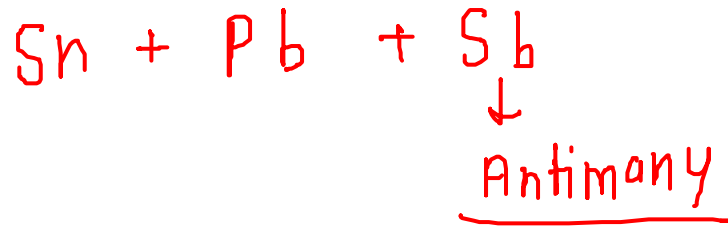
⑧ Solder:- $\frac{\text{Pb}}{(50\%)} + \frac{\text{Sn}}{(50\%)}$ \rightarrow Soldering ✓

⑨ Duralmin:-

Al	+	Cu	+	Mg	+	Mn
<u>64%</u>		<u>3%</u>		<u>2%</u>		<u>1%</u>

Uses:- utensils, parts of plane, car

① Type metal:-



uses:- Printing.

IMP

②

Stainless steel:-

(Steel \rightarrow 0.1%)

{ Fe \rightarrow 75%.
Cr \rightarrow 12%.
Ni \rightarrow 10%.
C \rightarrow 1% \rightarrow 0.1%

Uses:- surgical
cutlery.

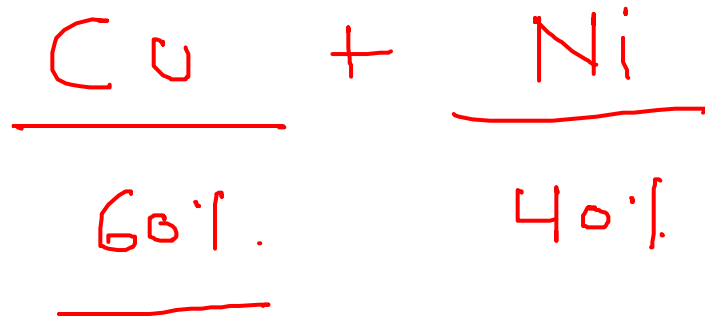
① Nickel Steel:- Fe + Ni + C

uses:- Automobile, electrical instruments.

② Brass (yellow):- Cu + Zn
67% + 33%

⇒ Hardware item

* Constantan (Eureka):-



Uses → Wires

* Nichrom:- Ni + Cr + Mn + Fe ✓✓

⇒ uses:- heater ✓

* Steel:- Iron + carbon ⇒ uses:- Ships

* Alnico:-
Al → 8-12%
Ni → 15-27%
Co → 5-25%
Cu → 6%

✓ Fe, Ti

⇒ uses ⇒ Magnet

Important Mineral and Ores

खनिज

अयस्क

• MINERAL (खनिज) ✓

• . A mineral is a Natural substance as coal, Salt, Oil etc specially one that is found in the ground.



• . Some minerals also present in food and drink and are very important for good health.



• Elements found in earth in the form of minerals. ✓

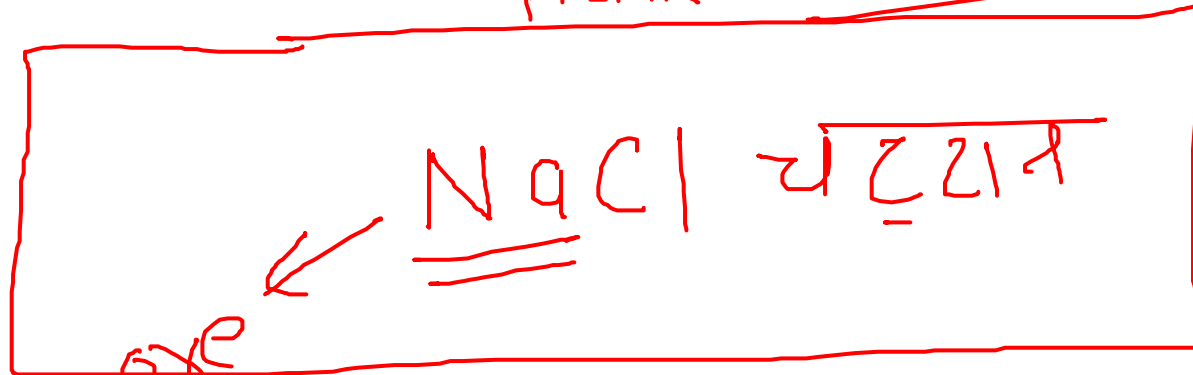
• For Example :

• 1. Halite: Halite commonly Known as rock salt is a type of salt, the mineral natural form of sodium chloride (NaCl).

• 2. Al₂O₃ · xH₂O (hydrated aluminum oxide) Bauxite से Aluminium .



Halite → mineral



खनिज

* Earth Crust:-

earth is the
main source of minerals.

e.g.:- Potassium (K), Sodium (Na), Ca,

Mg, Al, Zn, Fe, Pb

⇒ Minerals:- Natural materials { metal
compound }

⇒

Earth's Crust

⇒ ✓ Oxygen → ✓ 46.6% ✓

✓ Aluminum → 8%

Calcium → 3.5%

Potassium → 2.6%

Silicon → 27.8%

Iron → 5%

Sodium → 2.7%

Magnesium → 2.1%

Oxides ✓

⇒ "Minerals from which we can find or extract economically a valuable metal."

Form of oxides:-

⇒ Carbonate:- Ca, Zn, Fe

⇒ Sulphide:- Zn, Cu, Pb, Hg

* Halide:- Na, fluoride Silver

* Sulphate:-

* Iron (Fe):-

(i) Hematite $\rightarrow \text{Fe}_2\text{O}_3$

(ii) Limonite $\Rightarrow \text{Fe}_2\text{O}_3(\text{OH}) \cdot n\text{H}_2\text{O}$

(iii) Magnetite $\Rightarrow \text{Fe}_3\text{O}_4$

(iv) Iron Pyrite $\Rightarrow \text{FeS}_2$

(v) Copper Pyrites



(vi) Siderite $\rightarrow \text{FeCO}_3$

* Sodium:- (Na)

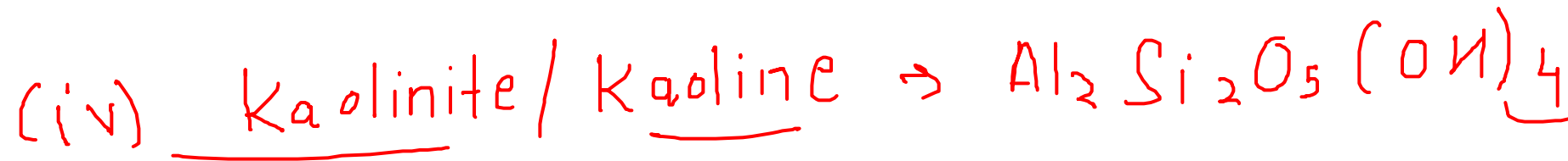
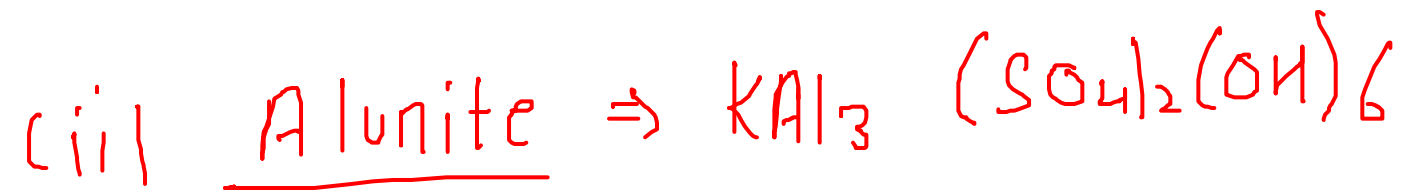
(i) Chili Salt Peter:- NaNO_3

(ii) Borax (भूएतल) :- $\text{Na}_2 [\text{B}_4\text{O}_5 (\text{OH})_4] \cdot 8\text{H}_2\text{O}$

(iii) Common Salt :- NaCl

(iv) Trona :- $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$

* Aluminum :- (Al)



* Potassium (K):-

(i) ~~Covalite~~ Carnalite \rightarrow $KCl \cdot MgCl_2 \cdot 6H_2O$

(ii) Salt Peter / Nitre \rightarrow KNO_3

* Magnesium [Mg]:-

(i) Magnesite \rightarrow $MgCO_3$

(ii) Dolomite \rightarrow $MgCO_3 \cdot CaCO_3$

(iii) Carnallite \rightarrow $KCl \cdot MgCl_2 \cdot 6H_2O$

(iv) Kieserite \rightarrow $MgSO_4 \cdot H_2O$

* Calcium [Ca]:

(i) Gypsum :- $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

(ii) Calcite :- CaCO_3

(iii) Asbestos :- $\text{SiO}_3 \cdot \text{MgSiO}_3$

(iv) Dolomite :-

(v) Fluorapatite
(फ्लुओर)

* Silver (Ag):

(i) Ruby silver / pyrrargyrite (Ag_3SbS_3)

(ii) Horn silver / cerargyrite (—)

* Copper (Cu):

(i) Cuprite $\rightarrow \text{Cu}_2\text{O}$

(ii) Copper Pyrite $\rightarrow \text{CuFeS}_2$

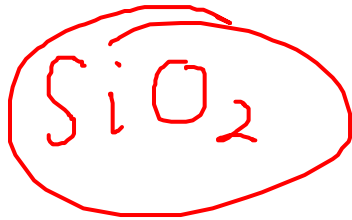
(iii) Copper Glance $\rightarrow \text{Cu}_2\text{S}$

~~(iv) Cuprit~~

* Tin (Sn):-

(i) Cassiterite

(ii) Tinstone \rightarrow Tin oxide \rightarrow $\left[\overset{\text{SnO}_2}{\text{~~TiO}_2}~~ \right]$



✓
✓

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